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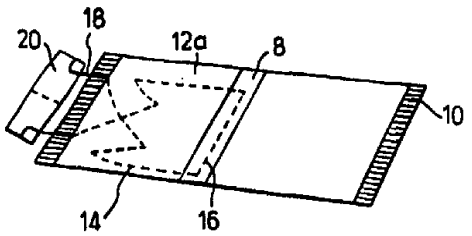
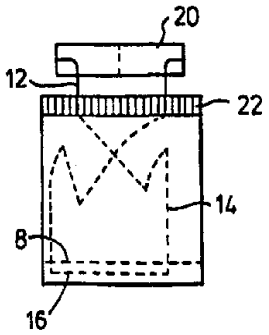
(54) Title: INFUSION PACKET AND ITS MANUFACTURE

(57) Abstract

An infusion packet comprises a pair of sealed compartments (12a, 12b) containing infusion material and joined together at opposite ends of the packet. A drawstring (14) attached intermediate its length to a connecting region (8) between the two compartments at one said end has pull portions extending between the compartments from said attachment and held movably at the opposite end of the packet, whereby said pull portions can be drawn apart to contract the packet. To produce the packet the compartments are initially formed end to end, joined by the connecting region. An intermediate portion (16) of the drawstring is attached to the connecting region before the compartments are doubled over to bring their opposite ends together with drawstring pull portions between them. Said opposite ends are then secured together in a manner permitting movement of the drawstring pull portions between them to contract the packet.





INFUSION PACKETS AND THEIR MANUFACTURE

This invention relates to packets containing infusion material, such as tea or coffee, and provided with a drawstring or thread for contracting the package to extract moisture after infusion.

Such squeezable packets have only been used on a small scale. Many of the forms of bag proposed are inefficient or unreliable, eg. allowing leakage of the material before use or rupturing too easily when squeezing pressure is applied. Others have not been able to be produced economically and yet others have been inconvenient to use or unattractive.

It would be desirable, therefore, to provide a packet which can, at least for the greater part, be produced in a conventional manner, and with which a drawstring or thread can be combined relatively simply and in a way which gives a good degree of reliability in use.

The present invention provides, in accordance with one of its aspects, a method of producing a packet comprising a pair of sealed compartments containing doses of infusion material and joined together at opposite ends of the packet, a connecting region joining the compartments at one said end and a drawstring being secured to said connecting region by a portion intermediate the length of the drawstring before the compartments are doubled over to bring their opposite ends remote from the connecting region together at said other end of the packet with pull portions

of said drawstring extending from said intermediate portion and running between the compartments to said other end of the packet to be held between the compartments at said other end, the compartments being secured together at said other end in a manner which permits withdrawal of said pull portions of the drawstring therethrough to contract the packet.

Preferably, the respective pull portions of the drawstring are detachably secured to each of the compartments intermediate the length of the respective compartment before the compartments are doubled over.

The pull portions can conveniently have ends projecting from said other end of the packet which, when said remote ends of the compartments are brought together, are attached to respective external tag means to make manipulation of the drawstring easier.

According to another aspect of the invention, there is provided an infusion packet comprising a pair of sealed compartments containing infusion material and joined together at opposite ends of the packet, a drawstring secured to a connecting region between the two compartments at one of said ends extending between the compartments from said connecting region to said other end of the compartments, the drawstring being secured by a portion intermediate its length to the connecting region and comprising respective pull portions extending between the compartments from said secured portion to be movably held at said other end of the packet, whereby said pull portions can be drawn apart to be tensioned to contract the packet.

The drawstring is conveniently fixed by sealing means to an inner face of said end connecting region, preferably at a location that does not coincide with the walls forming the compartments. Preferably the drawstring is so secured to said region that it spans substantially the full width of the compartments at said one end. The pull portions between the compartments are preferably so arranged that they continue from a respective laterally offset region of said end connecting region to an oppositely offset region at the other end of the packet.

It may be arranged that, prior to use of the packet, the pull portions at said other end of the packet are fixed to a margin of the packet and/or pull tag means secured to the packet, said margin and/or pull tag means being releasable from the packet to allow the pull portions to be drawn out of said other end to contract the packet.

In a preferred form of the invention, each pull portion has an excess length, that is to say a length greater than the shortest drawstring path between the opposite ends of the packet, retained between said two ends of the packet by releasable attachment to the compartment walls. By retaining these additional lengths of drawstring between the compartments the packet can be made more convenient to use. It may be preferred to gather the excess lengths at least mainly adjacent said other end of the packet. Conveniently, the excess lengths are attached to their respective compartments in a serpentine pattern that may extend substantially across the width of each

compartment.

In a further preferred feature, the compartments are so connected together at said other end of the packet as to leave free channels between them in which the drawstring pull portions are held captive but are freely slidable.

By way of example, the invention will be further described with reference to the accompanying drawings, in which:

Fig. 1a to 1d show a series of steps in the formation of an infusion packet according to the invention,

Fig. 2 shows the packet produced by the method illustrated in Fig. 1,

Fig. 3 illustrates a pair of compartments forming a second infusion packet according to the invention, with its drawstring, in an intermediate stage of the manufacture of the packet,

Figs. 4 and 5 are mutually transverse views of a later stage of the manufacture of the second packet,

Fig. 6 illustrates the completed packet,

Fig. 7 shows another pattern of thread as an alternative to the pattern shown in Fig. 3,

Fig. 8 illustrates a modification of the packet in Fig. 5,

Fig. 9 illustrates the packet of Fig. 8 after the excess thread has been drawn out from between the compartments, and

Fig. 10 illustrates a further alternative pattern

of thread, in an analogous manner to Fig. 7.

Figs. 1a to 1d illustrate a series of process steps that can be carried out on a continuous web of heat-sealable material to form a packet envelope as the web moves through successive operating stations. In a first station shown in Fig. 1a, doses of infusion material 2 are deposited on the initially flat web 4. The side margins of the web are then folded over and heat-sealed together with a longitudinal seal 6 to form a flat tube which contains the doses (Fig. 1b). Transverse strip-form seals 8,10 are next made at intervals to seal the individual doses into separate compartments 12a,12b (Fig. 1c). Although not necessarily separated from the continuous web at this stage, the body of each packet resulting from these steps comprises a pair of compartments 12 end to end, joined together at one end of the packet by the sealing strip 8 and closed at the other end of the packet by the rather narrower sealing strips 10.

A looped thread of a drawstring 14 is now placed onto one compartment 12a of the pair. The loop may be formed onto the web material or it can be transferred to it after being preformed. An intermediate portion 16 of the loop is located on the connecting region formed by the seal strip 8 (Fig. 1d) and the ends 18 of the drawstring extend over the seal strip 10 at the opposite end of the compartment. The projecting ends 18 are held in a tag 20. The thread is permanently secured to the seal strip 8 and to the tag 20, eg. by heat sealing. It is also releasably

attached to the compartment wall, eg. by tacking heat welds (not shown) at intervals along the convoluted pattern in which it lies on that wall.

The pair of compartments 12a,12b are then doubled over to bring them face to face, the separation of the pairs of compartments normally having been completed by this stage, and enclose the drawstring thread loop between them. The seal strip 8 is folded along its length to shape a V-form connecting region projecting inwardly between the compartments. The free ends of the compartments are heat-sealed together at their sealed edges 10 but unsealed passages are left where the thread ends run between those edges.

There is thus formed the packet of Fig. 2 in which the two compartments 12,12b are secured together at their opposite ends, by the seal strip 8 of the V-form connecting region and by end seal 22. The drawstring is permanently secured to the connecting region at the bottom of the packet, which meanwhile has been given the re-entrant V-fold, but the major part of the drawstring is releasably held in place against a wall of one compartment. The projecting ends 18 of the drawstring are trapped but are slidable in the end seal 22 at the top of the packet from where they project to be secured to the tag 20.

When the packet is to be used, by pulling the tag 20 the tack welds between the thread loop and the wall of the compartment 12a can be released and the surplus length of the thread loop can be loosely drawn out from the space

between the compartments. The packet can then be infused while the tag remains dry, outside the liquid. After infusion, the tag is separated into two parts by tearing through its central perforations 24. By then pulling the drawstring ends 18 away from each other the free lengths of thread form pull portions that draw the top and bottom of the compartments together, contracting the bag and squeezing liquid from the compartments. The manner in which the drawstring loop runs substantially from the two ends of the connecting seal strip to diagonally opposite, widely spaced locations at the top of the packet spreads the squeezing action on the infused material.

In Fig. 3 a flattened tubular web of envelope material from which the packet is formed is shown divided into two separate compartments 32a,32b by a pair of similar transverse heat seals 34a,34b forming a central connecting region 36, and the compartments being closed at their remote, other ends by further transverse seals 38a,38b. Each compartment contains a dose of infusible material (not shown) which is inserted before it is sealed closed.

A drawstring 40 is laid onto the pair of compartments in a pattern comprising a first entry run 42 of the thread passing longitudinally of the web over the end transverse seal 38a near one side edge 44a of the compartments, a convoluted run 46 comprising two serpentine folds partly overlapping that end seal and extending nearly the full width of the tubular web. The convoluted run 46 terminates near the opposite side edge 44b to the entry run

42, and the thread layout continues in a straight run 48 along the compartment extending close to that opposite side edge 44b to the connecting region 36. The thread then passes in a transverse run 50 over the centre of the connecting region 36 extending across almost the full lateral extent of the tubular web and the pattern is repeated in an inverted form on the other of the two compartments, the corresponding runs of thread being designated by the same reference numbers with the added suffix "a".

The thread is attached to the web, conveniently by heat sealing (although as in all the examples an adhesive may be used instead), with a permanent bond of the transverse run 50 in the connecting region and with weaker, detachable bonds of the other runs, sufficient to retain the thread in the pattern in which it has been laid, but able to be released to allow these parts of the drawstring to act as a pair of pull portions in use. The attachments of the convoluted runs 46,46a can be confined entirely to the regions of the end seals 38a,38b to ensure that there is no risk of rupturing the compartment walls.

Preferably, a continuous tubular web is formed with a series of transverse heat seals in a continuous dosing and sealing process as described in the first example, the pairs of compartments being thereby formed as a continuous series joined end to end and being separated at a later stage. The drawstring can be laid in a continuous length onto the web while the pairs of

compartments remain joined together. It may be noted that although the drawstring pattern will run in a continuous manner along successive pairs of compartments, in each succeeding pair of compartments it will be laid in a mirror image to the pattern in the preceding pair of compartments.

Each pair of compartments is separated from the continuous web length after the drawstring has been attached to them in the pattern described. The pair of compartments are then folded together about their connecting region to bring their mutually remote ends together. These ends are secured together by a superimposed seal over their endmost regions, that is to say, as far as a boundary 52. The convoluted runs 46,46a are left clear of the end seal and the portions of the thread running past said endmost regions of the compartments are held in a manner which still allows them to be drawn out in the direction of the illustrated sealing crimps 54. In the course of the folding step, the connecting region 36 has been folded inwards with the transverse seals 34a,34b forming an inverted-V (shown in Fig. 4) between the main bodies of the compartments. The transverse thread run 50 lies at the apex of the V.

A folded tag card 58, preferably having a heat sealing coating on its inner faces, is brought over the joined ends, partly overlapping the end seal, and the card is heat-sealed in place. Transverse lines of weakening 56 are then formed in the end seal regions, coincident with the edge of the tag card substantially in the middle of the

width of the seal. In sealing of the folded tag card in place, the entry runs of the drawstring are permanently secured between the web walls where they are overlapped by the tag card. Manufacture of the packet is now complete, although for packaging the tag card may be folded over as shown in Fig. 6, to make the packet more compact.

It will be understood without further illustration that the folded tag card 58 can be replaced by a flat tag card attached to one side of the joined ends of the packet.

When the packet is to be used, the tag card 58 is torn from the main body of the packet along the line of weakening 56, but it remains attached to the main body by the two entry runs 42,42a of the thread held movably in the remaining portion of the end seal between the line of weakening and the boundary 52. The card has a central line of weakening 60 allowing it to be separated into two tags, each attached to one of the entry runs. By then drawing the two tags apart the detachable bonds of the convoluted runs 46,46a can be ruptured and that part of the drawstring can be drawn out from between the compartments. The packet can now be infused, with the two tags hanging free of the liquid which the packet is immersed.

When infusion is complete, the tags can be drawn further apart, the straight runs 48,48a now being pulled through the end seal to contract the packet and so squeeze out excess moisture. To make the bag easier to use, it can be arranged that the straight runs 48,48a are attached by

seals that have a greater resistance to rupture than the convoluted runs 46,46a, so that the user senses this when he first pulls out the excess length of thread and more easily avoids contracting the packet before infusion.

Fig. 7 shows an alternative layout of the drawstring thread that can be used, for example, in the packet of Fig. 3. The excess thread is accommodated in zig-zag patterns 70,70a that extend from the central run 50 over the length and width of the packet rather than only the width as in Fig. 3.

The packet of Figs. 8 and 9 is generally similar to that shown in Figs. 4-6 and corresponding parts are indicated by the same reference numbers. The ends seals joining the two compartments together are now formed so as to leave open channels 62 through which the entry runs 42,42a pass, so making it easier to draw out the thread. Fig. 9 illustrates the bag at the stage at which the excess thread has been drawn out from between the compartments, in preparation for immersing the bag to infuse its contents, but before the two tags have been separated and used to pull the drawstring and contract the packet.

Fig. 10 shows a further alternative layout of the drawstring 14 that can be used in the packets described above, eg. the packet of Fig. 3. As in that earlier example excess thread is arranged in two convoluted runs 80,80a which can be disposed remote from the central run 50, in the regions of the end seals of the tubular web (not shown) similarly to the runs 46,46a of Fig. 3. In each run

80,80a the thread is looped across the width of the web in three passes as in the runs 46,46a of Fig. 3, but now overlapping.

In the examples described, the methods of formation of the sealed compartments from the web material can be conventional and may be performed with existing apparatus. The formation of the thread loops and their addition to the packets can be incorporated relatively simply in this process.

The method of the invention allows any desired length of drawstring thread to be provided in a packet in a manner that is secure, and in particular that minimises the risk of leaving thread hanging freely where packets might become entangled. It is possible to have a wide choice for the configuration of the thread loop without affecting the construction of the packet compartments themselves.

It is also notable that because the drawstring is held externally of the compartments themselves, it will not compromise the sealed containment of the infusible materials they carry.

Another feature of the illustrated examples is that the attachment of the thread need not weaken the packet and in particular the thread is not permanently attached to a compartment wall where the tension applied through the thread might rupture a compartment and allow its solid contents to escape.

CLAIMS

1. An infusion packet comprising a pair of sealed compartments containing infusion material and joined together at opposite ends of the packet, a drawstring secured to a connecting region between the two compartments at one of said ends extending between the compartments from said connecting region to said other end of the compartments, the drawstring being secured by a portion intermediate its length to the connecting region and comprising respective pull portions extending between the compartments from said secured portion to be movably held at said other end of the packet, whereby said pull portions can be drawn apart to be tensioned to contract the packet.

2. A packet according to claim 1 wherein the compartments are so joined together at said other end as to leave free channels between them in which the drawstring pull portions are held captive but are freely slidable.

3. A packet according to claim 1 or claim 2 wherein the drawstring is fixed by sealing means to an inner face of said end connecting region.

4. A packet according to claim 3 wherein the drawstring is fixed to said inner face at a location spaced from the walls of the compartments.

5. A packet according to any one of the preceding claims wherein the drawstring pull portions are releasably attached to at least one of the compartments intermediate said opposite ends.

6. A packet according to any one of claims 1 to 4 wherein said pull portions are each attached to a respective one of the two compartments between said ends.

7. A packet according to claim 5 or claim 6 wherein said releasable attachment of the drawstring pull portions is located on a sealed boundary of one or both compartments.

8. A packet according to any one of the preceding claims wherein the length of each pull portion retained between said opposite ends of the packet is greater than the distance between said ends.

9. A packet according to claim 8 wherein the excess length of said pull portions between said ends is at least mainly gathered adjacent said other end of the packet.

10. A packet according to claim 8 or claim 9 wherein said excess length of each pull portion is attached to its respective compartment in a serpentine pattern extending substantially across the width of the compartment.

11. A packet according to any one of the preceding

claims wherein the drawstring is secured to said connecting region to extend across substantially the lateral extent of the region at said one end.

12. A packet according to any one of the preceding claims wherein at said other end the pull portions are located in laterally opposite regions of the joined compartments.

13. A packet according to any one of the preceding claims wherein tag means are attached to the pull portions at said other end.

14. A packet according to claim 13 wherein said tag means are also attached to said other end of the packet.

15. A packet according to claim 14 wherein said tag means are attached to an end margin of the packet separable from the main body of the packet by a line of weakening.

16. A packet according to any one of claims 12 to 14 wherein the tag means comprises two separable portions, each secured to a respective drawstring pull portion.

17. A method of producing a packet comprising a pair of sealed compartments containing doses of infusion material and joined together at opposite ends of the packet, a connecting region joining the compartments at one

said end and a drawstring being secured to said connecting region by a portion intermediate the length of the drawstring before the compartments are doubled over to bring their opposite ends remote from the connecting region together at said other end of the packet with pull portions of said drawstring extending from said intermediate portion and running between the compartments to said other end of the packet to be held between the compartments at said other end, the compartments being secured together at said other end in a manner which permits withdrawal of said pull portions of the drawstring therethrough to contract the packet.

18. A method according to claim 17 wherein the packet compartments are formed and filled before attaching the drawstring.

19. A method of manufacturing a packet comprising a pair of sealed compartments containing doses of infusion material and joined together at opposite ends, the compartments being initially formed end to end and joined by a connecting region between them, a drawstring being laid along the length of the two end to end compartments and an intermediate portion of its length being secured to said connecting region, pull portions of said drawstring extending from said intermediate portion and being detachably secured to the respective compartments intermediate said ends, the compartments then being doubled

over to bring their remote ends together, said ends being secured together to hold the drawstring pull portions between them in a manner which permits movement of said pull portions of the drawstring to contract the packet by drawing the opposite ends of the compartments towards each other.

20. A method according to any one of claims 17 to 19 wherein parts of the pull portions of the drawstring between the compartments are attached in a convoluted form to the respective compartments.

21. A method according to any one of claims 17 to 20 wherein tag means are attached to the drawstring pull portions after the compartments have been secured together at said ends remote from said connecting region.

22. A method according to claim 21 wherein the tag means are attached to the pull portions through the web material at said ends of said compartments remote from said connecting region.

23. A method according to claim 22 wherein a line of weakening is provided in said ends of the compartments at the tag means to facilitate detachment of the tag means with their drawstring pull portions.

24. An infusion packet constructed and arranged for

use substantially as described herein with reference to any of the examples shown in the accompanying drawings.

25. A method of manufacturing an infusion packet according to claim 1 and substantially as described herein.

Fig.1a.

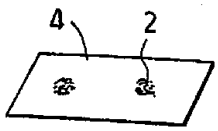


Fig.1b.

Fig.1c.

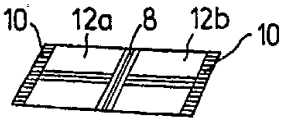


Fig.1d.

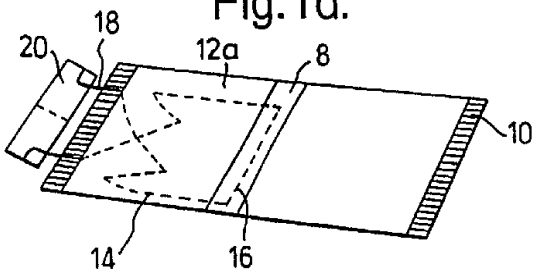


Fig.2.

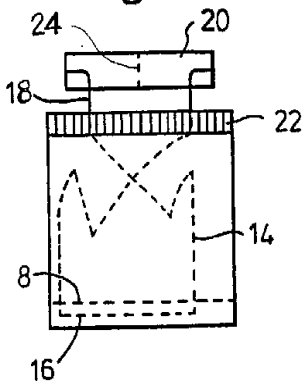


Fig.3.

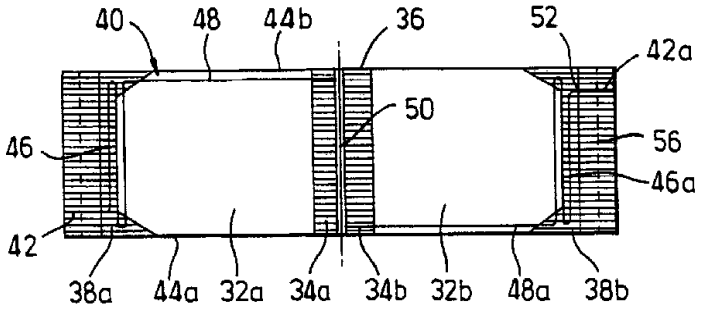


Fig.4.

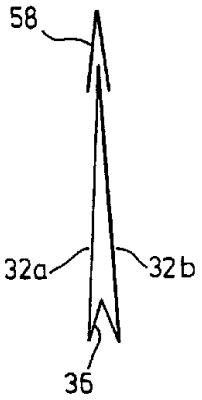


Fig.5.

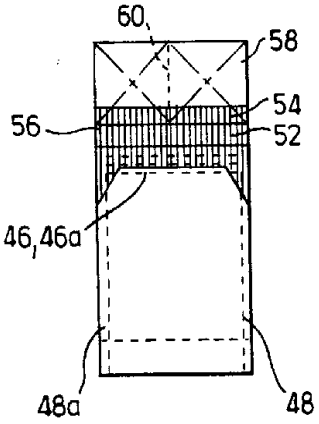


Fig.6.

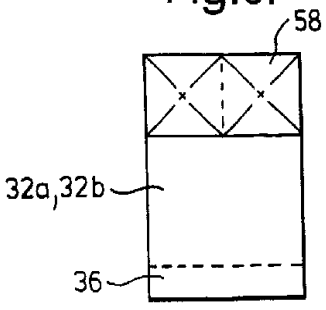


Fig.7.

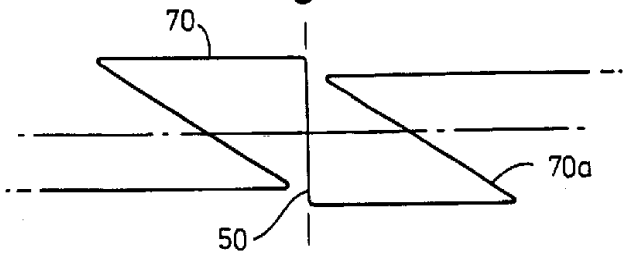


Fig.8.

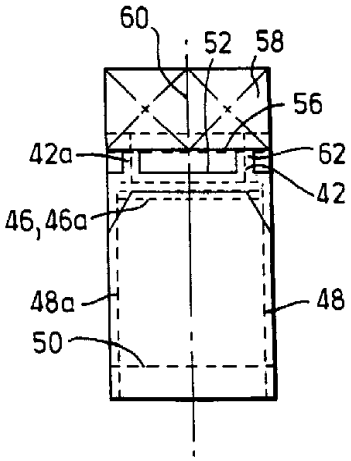


Fig.9.

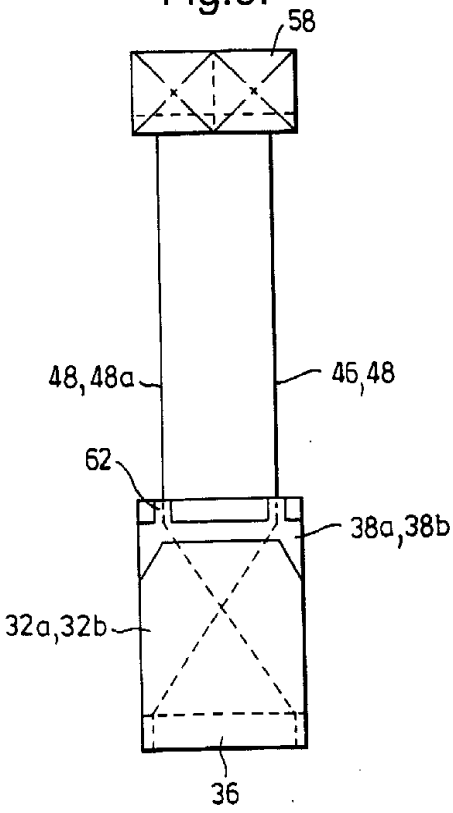


Fig.10.